

Design for Security HWG

Summary Update

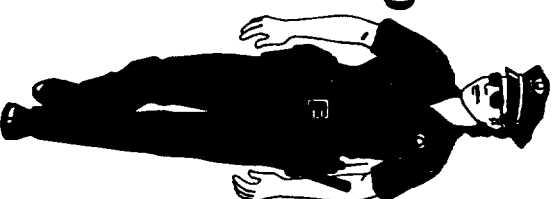
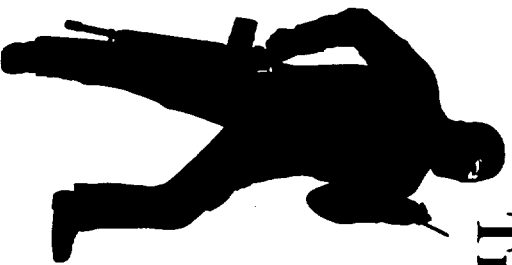
Transport Airplane and Engine Issues Group

Seattle, Washington

Mark Allen - Chair

Boeing - Structures

June 26, 2001



ARAC Members

Mark Allen - Chair
Boeing - Structures

Joel Siqueira
Embraer - Design

Jeff Gardlin
**FAA - Cabin Safety &
Airframe**

Dave Melberg
Boeing - Flight Deck

Gale Meek
Cessna - Certification

Steve Loukusa
Boeing - ECS

Captain Peter Reiss
IFALPA / ALPA

Ed Kittel
FAA - Explosives

Michael Purwins
EADS Airbus - Certification

Brian Wall

Rory Martin

IATA - Security Services

JAA / CAA - Structures

Keith Ayre
Bombardier - Systems

Maurizio Molinari
Transport Canada
Structures Engineering

Eric Duvivier
JAA / DGAC
Cabin Safety & ECS

General

Working Group Tasked With Eight ICAO Rules: (*And One FAA Initiated Rule*)

- * Flight Deck Smoke Protection
- * Cabin Smoke Extraction
- * Cargo Compartment Fire Suppression
- * Systems Survivability
- * Least Risk Bomb Location (Identification)
- * Least Risk Bomb Location (Design)
- * Design for Interior Search
- * Penetration Resistance
- * *Flight Deck Intrusion - June 11, 2001 Federal Register*



Flight-Deck Smoke Protection

**Smoke Entry From any Compartment
and any Flight Condition**

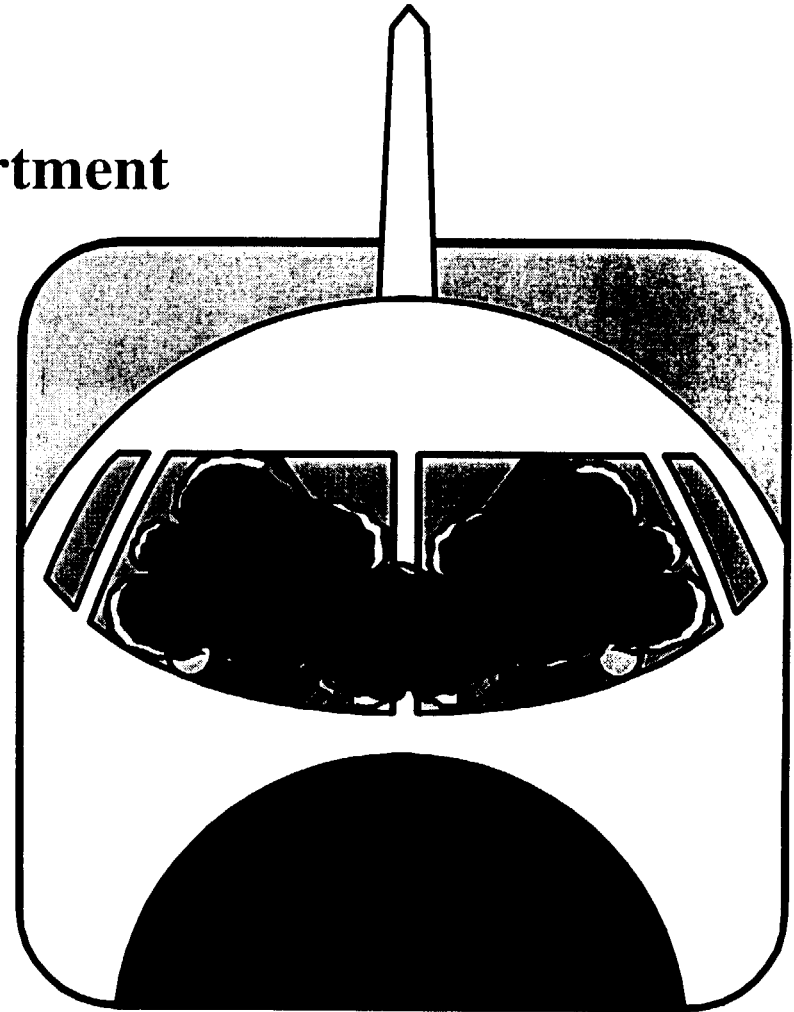
No System Damage Assumed

Switch-Activated Airflow Boost
(TBD by FAA) - *beyond the deadline
will be left open*

MMEL Requirement

No Recirculated air

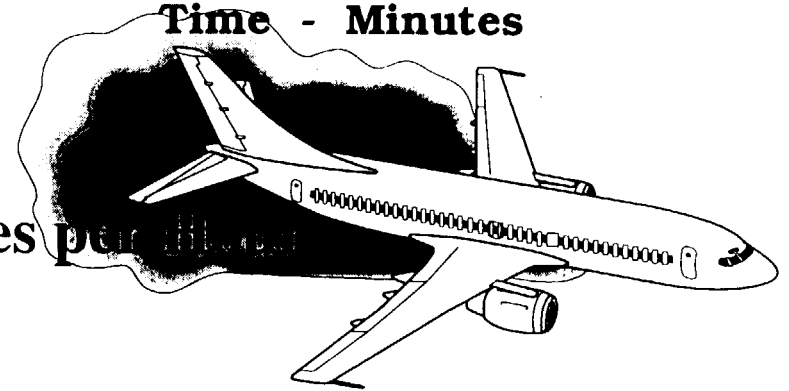
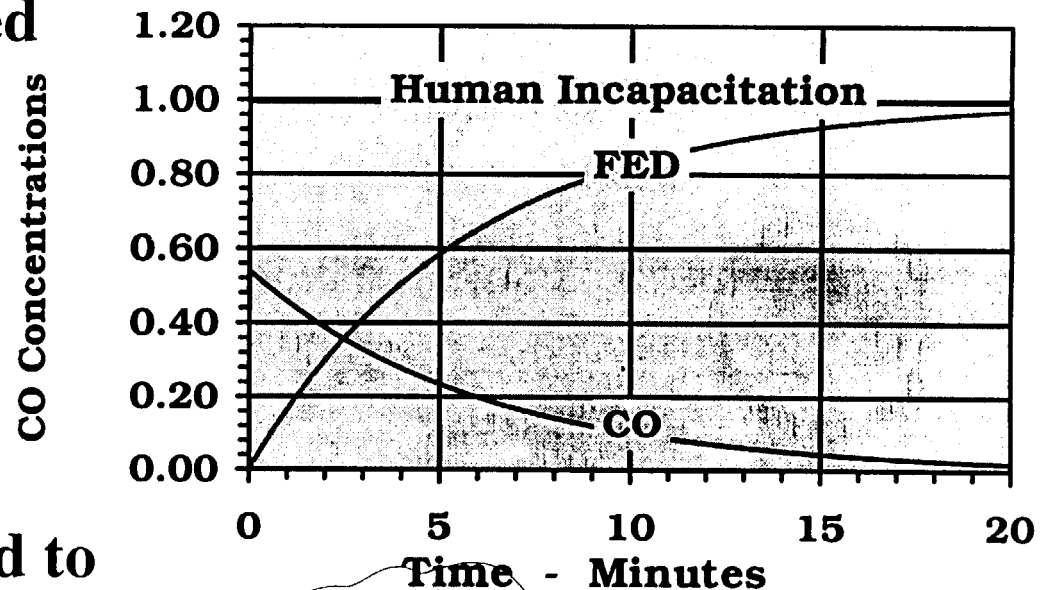
No Airflow Reduction to Passenger Compartment



Cabin Smoke Extraction

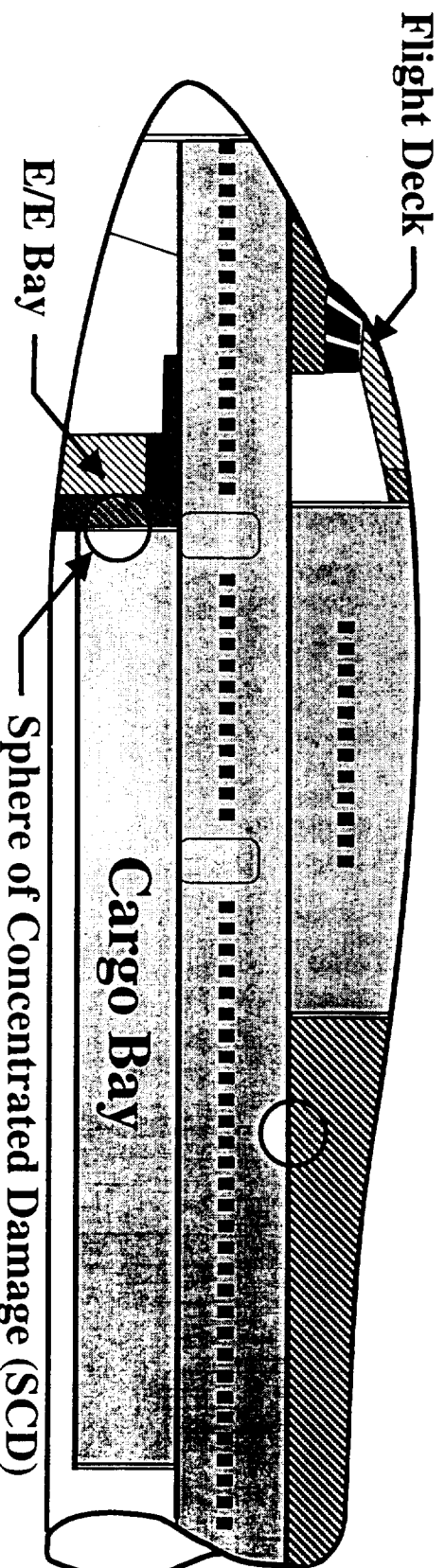
- Smoke Quantity Undefined
- Depressurization not Effective
- CO Ventilation Model
- Human Tolerance Related to Fractional Effective Dose (FED)
- Max Requirement : 15 Air Changes per Hour
- Supplemental Oxygen Effective

Cabin and Passenger CO Concentrations



Systems Survivability

**Rule Will Resemble FAR 25.365(e) - "20 Square-Foot Hole Rule"
Circular Area Converted to a Spherical Diameter**



- | | | | | | | | |
|-----------------------------------------------------------------------------------|------------------|-----------------------------------------------------------------------------------|------------------|-------------------------------------------------------------------------------------|--------------------|-------------------------------------------------------------------------------------|------------------|
|  | Critical Systems |  | Region Requiring |  | Region Potentially |  | Passenger Access |
| Location | | Separation | | Requiring Separation | | Area | |

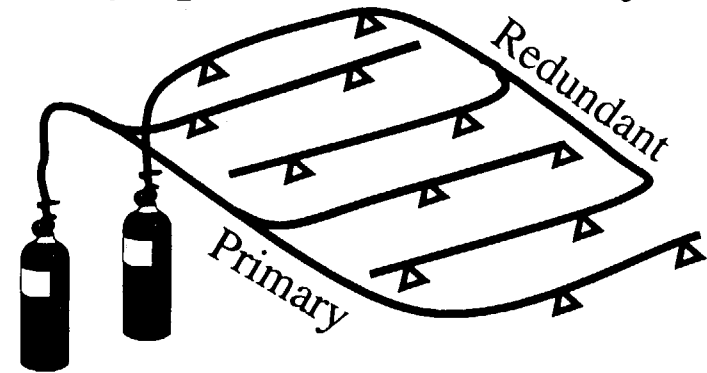
SCD Applied Throughout Passenger Access Area
Separation Not Mandatory in Areas That Concealment is Impossible
Separation Required if Feasible Outside Access Areas
Systems Protection Undefined if Separation is Unachievable

Cargo Compartment Fire Suppression

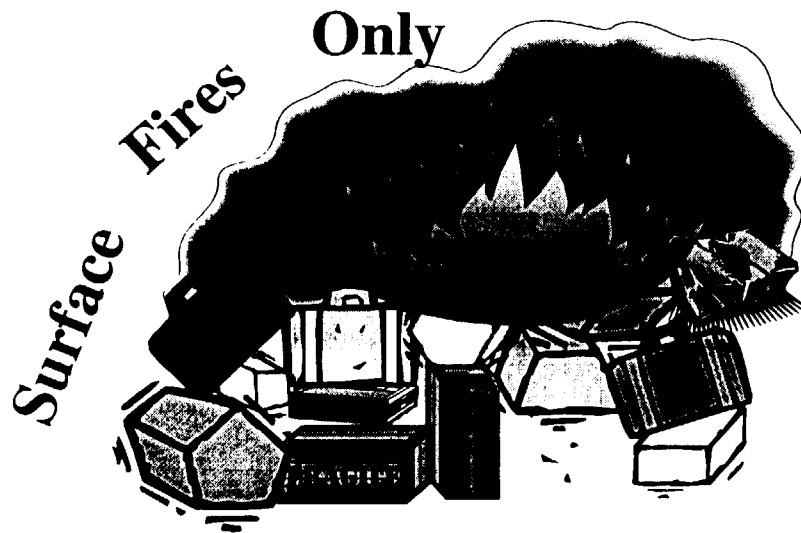
FAA Definition



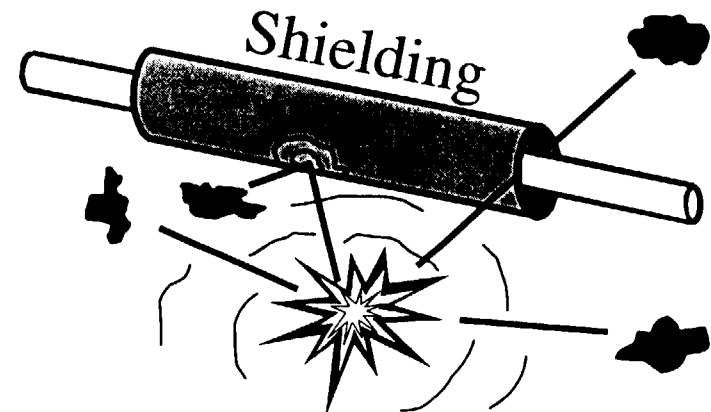
Closely Spaced Redundant Systems



(Inadequate for Systems Separation)



Shielding Requirements Undefined

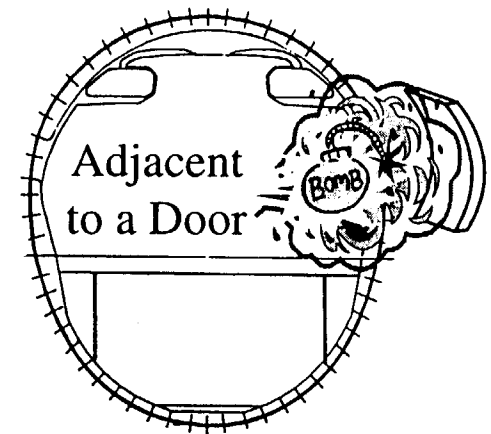


Least Risk Bomb Location

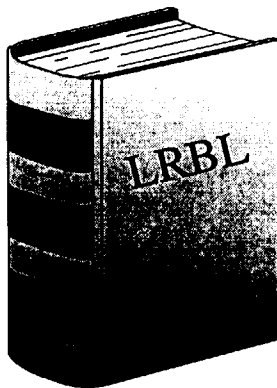
(Design & Identification)

- Specific Threat not Identified
- FAA may Specify Damage Size for Other Locations

FAA
Preferred
Location

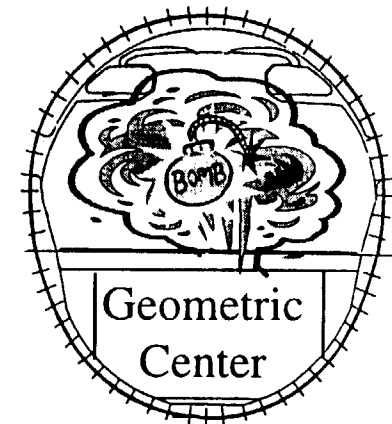


LRBL Procedures



- Manufacturer Creates
- FAA Distributes

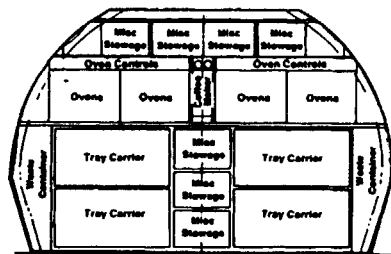
Proposed
Alternative
(Future Test)



Design for Interior Search

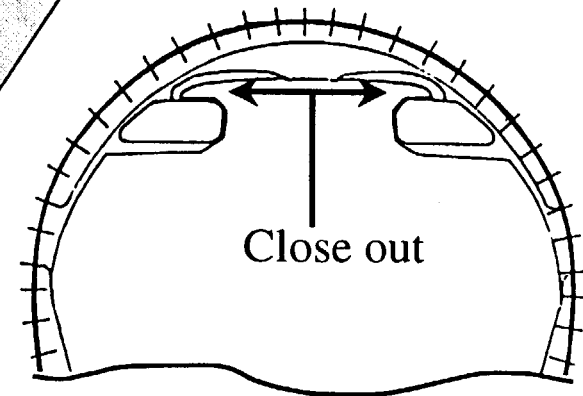
Design for Ease of Inspection and Difficulty for Hiding

Specific Items / Regions Identified for Compliance



- Galleys / Lavatories
- Overhead Bins
- Life Vests
- Seats

- Paneling
- Crew-Rest Areas
- Closets & Lockers
- Flight Deck



Penetration Resistance

Flight Deck Protection From all Passenger Compartments

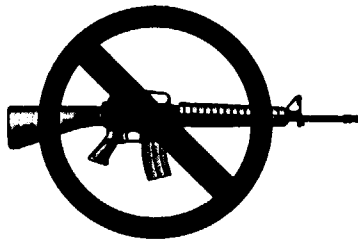
No Acceptable Baseline Approved in AC

Protection Follows NIJ Standard 0101.04

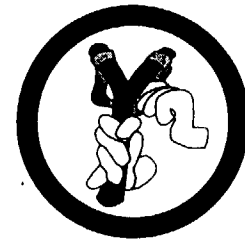
- *.44 Magnum & 9mm @ 1400 fps*
- *Six Shots Each Bullet Type*
- *0° and 30° Impact Angles*
- *No Penetrations Allowed*



Enhanced Designs (by analyses) Need not be Tested



Rule Essentially Complete



Flight Deck Intrusion

- Design for Entry Delay, not Impenetrable Barrier
- Protection Follows NILECJ Standard 0306.00
 - Medium Door Security
 - Based on Historical Break-Ins
 - Two Impacts Each (160 Joules)
 - Door Center
 - Door Latch
 - 250 lb. Pull on Doorknob
- Blow-out Panels Permitted
- Separate Doors for Each Test



Issue

ICAO Air Navigation Commission overruled:

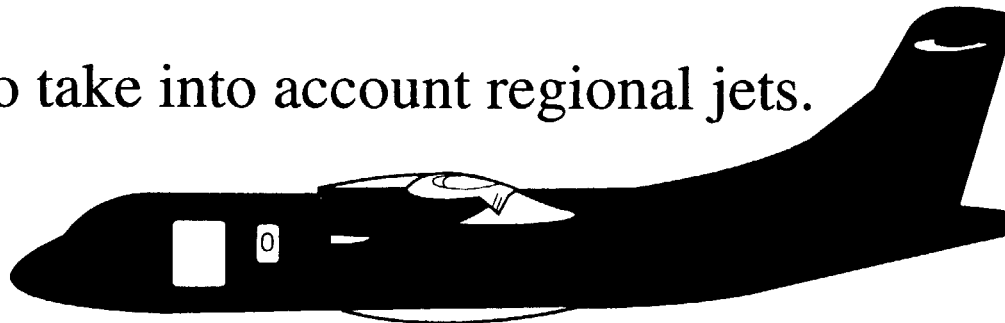
From SAA/TC position

"greater than 60 passengers and 45,500kg maximum certificated takeoff mass"

in favor of :

"30 or more passengers and 25,000kg maximum certificated takeoff mass"

to take into account regional jets.



*ICAC has not adopted yet
if adopted
new members
can*

Issue

Notice of Proposed Amendment (NPA) for CAR 605.XX (new)

Canadian Ministerial (Air Carrier Security Measures Act)

Locked Flight-Crew Doors

"Prohibition Against Interference
with Crew Members"

Other (Air Rage?) Issues in Work

Will Publish 3-5 Related NPA's

Developed by Cabin Safety Standards,

AARXF



Meeting Schedule

Seattle, Wa.

24 - 26 Apr 2001

Paris, F

24 - May 2001

Washington D.C.

2 - 4 Oct 2001